

Attorney Docket No. 129969

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of :  
Narendra D. JOSHI et al. : Confirmation No.: 1869  
Serial No.: 10/604,870 : Group Art Unit: 3661  
Filed: August 22, 2003 : Examiner: GIBSON, Eric M.  
Method And Apparatus For Recording And :  
Retrieving Maintenance, Operating And  
Repair Data For Turbine Engine Components

**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**  
**APPELLANTS' BRIEF**

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

This is an appeal from the final rejection dated February 10, 2006, of Claims 1-12 and 14-29 of the captioned application.

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REAL PARTY IN INTEREST

The Real Party in Interest in the captioned application is the General Electric Company by assignment executed by all inventors dated August 21, 2003, and recorded August 26, 2003, in the Assignment Division of the U.S. Patent & Trademark Office at reel/frame 013995/0299.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellants, the Appellants' legal representatives, or the assignee that would directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

STATUS OF THE CLAIMS

Claims 1-29 are presently pending in the case. The rejection of Claims 1-12 and 14-29 are subject of this Appeal, and are reproduced below in APPENDIX A. The claims include independent Claims 1, 20, 24 and 27. Claim 13 has been objected to for depending to a rejected claim, but would be allowable if written in independent form. Only Claims 1-12 and 14-29 pending in the application have been rejected.

STATUS OF AMENDMENTS

The claims presented in CLAIMS APPENDIX A are in the form as presented in the application filed August 22, 2003, following the Amendment dated March 28, 2005 in response to the Office Action dated December 29, 2004 and the Amendment filed November 28, 2005, in response to the Office Action dated August 26, 2005. No amendments to the claims have been made subsequent to the issuance of the final rejection.

### SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1 is drawn to an apparatus for recording, storing, updating and retrieving of operating, maintenance and repair information that relates to at least one part of at least one individual engine component (22 of the Figure) of a turbine engine (20). The apparatus comprises at least one information storage device (24) permanently deployed on said at least one individual engine component (page 11, lines 14-15). The information storage device comprises (a) identification information about said at least one part of the individual engine component stored thereon (page 11, lines 16-19), and (b) at least one updatable data register (page 5, line 9 and page 11, lines 19-21) having data storage capability. The data register is referenced by stored identification information of said at least one part (page 5, lines 10-11 and page 9, lines 21-23) and a parameter recorded by said data register (page 5, lines 11-12 and page 9, line 23 through page 10, line 6). The information storage device is accessible for at least one of the following:

- i) recording and storing maintenance work done when the individual engine component undergoes maintenance (page 5, lines 14-15 and page 9, lines 15-17);
- ii) updating said information storage device when said at least one part is exchanged for a replacement part (page 5, lines 15-17 and page 13, lines 4-7); and
- iii) retrieving recorded and stored information in said information storage device under certain selected conditions (page 5, lines 17-19).

Independent Claim 20 is the same as Claim 1, except wherein the part is a life limited part of a gas turbine engine (page 2, lines 7-10 and page 10 lines 11-13).

Independent Claim 24 is drawn to a method for recording, storing, updating and retrieving of operating and maintenance information relating to at least one part of an individual engine component of a turbine engine (page 6, lines 18-21). The steps include:

- a) providing at least one information storage device permanently deployed on at least one individual engine component (page 11, lines 14-15);
- b) storing identification information about the at least one part of the individual engine component in the information storage device (page 9, lines 20-22);

- c) providing at least one updatable data register in the information storage device having data storage capability (page 11, line 19 through page 12, line 9 and page 13, lines 4-7);
- d) referencing each data register with stored identification information of the at least one part and a parameter recorded by each data register (page 9, line 20 through page 10, line 1);
- e) operating the engine and recording operating parameter data in at least one data register (page 7, lines 7-9); and
- f) a step selected from at least one of the following steps:
  - (i) storing maintenance work done when the individual engine component undergoes maintenance (page 9, lines 15-17);
  - (ii) updating the information storage device when at least one part is exchanged for a replacement part (page 13, lines 4-7); and
  - (iii) retrieving recorded and stored information from the information storage device under certain selectable conditions (page 5, lines 17-19).

Independent Claim 27 is the same as Claim 24, except wherein the part is a life limited part of a gas turbine engine (page 2, lines 7-10 and page 10, lines 11-13).

Dependent Claim 16 provides that the supplied information to the information storage device is from a remote location (page 9, lines 9-15).

Dependent Claims 11 and 18 provides that the information storage devices can be polled to predict future maintenance requirements of the engine (page 14, lines 15-23).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The two grounds of rejection for appeal herein are:

Issue 1: whether Claims 1-10, 12, 14-17 and 19-29 are patentable under 35 U.S.C. §103(a) over U.S. Patent 4,280,185A to Martin, in view of U.S. Patent Publication 2004-0024501 A1 to Muehl et al and in view of U.S. Patent 6,321,983 to Katayanagi et al.

Issue 2: whether Claims 11 and 18 are patentable under 35 U.S.C. §103(a) over U.S. Patent 4,280,185A to Martin, in view of U.S. Patent Publication 2004-0024501 A1 to Muehl et al, U.S. Patent 6,321,983 to Katayanagi et al, and U.S. Patent 5,968,107 to Vogan et al.

## ARGUMENT

### Issue 1: The Rejection of Claims 1-10, 12, 14-17 and 19-29 under 35 U.S.C. §103(a):

The Examiner summarily rejected claims 1-10, 12, 14-17 and 19-29 on a single ground of rejection under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 4,280,185A to Martin in view of U.S. Patent Publication 2004-0024501 A1 to Muchl et al and in view of U.S. Patent 6,321,983 to Katayanagi et al. In so rejecting Applicants' claims, the Examiner stated that Martin teaches an apparatus for recording, storing, updating, and retrieving operating, maintenance and repair information relating to individual components of turbine engines, including at least one information storage device permanently deployed on at least one individual component (64, FIG. 1), identification information about the engine component (30-35, FIG. 1), at least one data register having data storage capabilities referenced by stored identification information of at least one part and a parameter (column 8, lines 17-21), wherein the information storage device is accessible for retrieving recorded and stored information (column 4, lines 37-42); that Martin explicitly teaches that the storage devices include information on the individual engine modules (see column 3, lines 38-58), but does not explicitly teach that the one individual component identifies at least one part of the entire engine.

The Examiner also stated in part a. of the rejection that Muehl et al teaches individual component tagging of engine parts for maintenance related reasons, but does not explicitly teach identifying at least one part of a component of an engine with upgradeable data storage registers that specifically store identification information about an individual part of the larger component (page 3, paragraphs [0030]-[0034]) (emphasis added).

In part b. of the rejection, the Examiner states that "the combination of Martin and Muehl do not teach storing information on individual parts of the components making up the turbine engine." (Note: this statement is inconsistent with the statement about Muehl in part a. of the rejection mentioned above.)

The Examiner concluded the rejection by stating:

(1) that the benefits of teaching components of an engine and storing the maintenance and repair histories is taught by the combination of Martin and Muehl et al;

(2) that this benefit would also be desirable to one of ordinary skill to obtain such details on the “part level” of the engine, rather than just the engine component level; and

(3) that Katayanagi et al teaches a general method for managing life cycles of replaceable products, and the desire to store individual part information associated with the components/product (see column 10, lines 17-52);

(4) that technological advances, such as smart cards and RFID tags have made data storage easier, and that these technology advances, along with “the obvious desire” to store information regarding maintenance and repairs, would have been obvious to one of ordinary skill in the art at the time of the invention; and finally

(5) that it would have been obvious to one of ordinary skill in the art, at the time of the invention, to also store information about individual parts of engine components making up the turbine engine, in the system taught by the combination of Martin and Muehl et al, since more detailed information is both desired and made easier by advances in technology, as evidenced in Katayanagi, for example.

The References:

Martin discloses an apparatus related to an engine, which tracks the engine modules of the engine as module units. Martin monitors and maintains records on the unit modules, as described at column 4, lines 37-42.

Muehl et al describes tagging complex articles and components of complex articles with maintenance related information. Muehl et al defines components as “engines, axels, wheels, arms, and body frames”, and “complex articles” as “physical incarnations formed by one or more physical components”. Muehl et al teaches placement of information tags onto the engine components for maintenance related reasons.

Katayanagi et al teaches a product having an information storage medium affixed to the product, the storage medium containing product identifier and information about the parts that make up the product. The products’ life cycle can be stored on the storage medium to dictate the products’ destruction.

The Invention Distinguished From the References:

Claims 1-10, 12, 14, 15, 17, 19-29

In rejecting the above claims of Appellants' application over Martin in view of Muehl and Katayanagi, the Examiner has failed to state a *prima facie* rejection, by failing to support the rejection with any motivation for combining the cited art. Instead the Examiner used the motivation and teaching of Appellants' invention to search for and identify a prior art reference. The attention of the Board is respectfully invited to the following points of discussion that show clearly the unobviousness of Appellants' invention over the art of record.

(1) The Examiner's Office Action dated August 26, 2005 had stated the conclusion that "Muehl does explicitly teach identifying at least one part of a component of an engine with upgradable data storage registers that specifically store identification information about an individual part of the larger component" (emphasis added). The Examiner cited page 3, paragraphs [0030]-[0034] of Muehl et al in support of this statement. This statement by the Examiner was plainly false. Muehl et al does not identify or mention in its description any engine "part" as a part of an engine component. Rather, Muehl et al does disclose at paragraph [0030] that "engine 110" is a component of "aircraft 100" and that "compressor 115 is a component of both engine 110 and aircraft 100." However, Muehl et al does not disclose a part of an engine component.

(2) Applicants' representatives conducted an interview on November 3, 2005 by telephone with the Examiner. The interview followed the Office Action mailed Aug. 26, 2005, with the misstatement by the Examiner above in item (1) that "Muehl does explicitly teach identifying at least one part of a component of an engine with upgradable data storage registers that specifically store identification information about an individual part of the larger component". In the interview, the Applicants' representatives explained to the Examiner that Muehl did not in fact teach anything about parts of an engine component. The Examiner apparently agreed with the Applicant. The interview summary prepared by the Examiner and mailed on Nov. 9, 2005 states: "The Examiner agreed with the Applicant that storing data on the part level of the engine component was not taught by the prior art of record."

(3) The Applicants point out that the Examiner's rejection in the Final Action dated February 10, 2006 has a significant inconsistency. At page 3 lines 6-9, the Examiner repeats

(actually, copied and pasted) the earlier-quoted statements from the August 26, 2005 Office Action. Then in part b., on page 3 at lines 17-18, the Examiner states “The combination of Martin and Muehl does not teach storing information on individual parts of the components making up the turbine engine.” For the purposes of this Appeal, the Applicants then assume that statement part b. is the Examiner’s present position regarding the combined teaching of Martin and Muehl, that they do not teach individually or in combination storing information on individual parts of the components making up the turbine engine.”

(4) The Applicants at this point pose the important question, “on what basis then did the Examiner originally draw the incorrect conclusion that the Muehl taught about “parts” of an engine component? Clearly, Muehl and Martin did not in fact teach identifying and tracking such parts. Applicants also contend that Muehl et al does not suggest or imply the storing and tracking of information on individual parts of the components making up the turbine engine. Applicants have concluded the Examiner received his original false impression and belief about the teaching of Muehl from reading the description of Applicant’s invention. With Applicants’ invention in mind, the Examiner read into Muehl the claim limitations of Applicants’ invention.

(5) This is where the prosecution should have ended. Since the combination of Martin and Muehl, arguably representing the state of the art in engine component identification and tracking, did not teach or suggest Applicants’ invention, the application should have been allowed.

(6) However, the Examiner stated in the Interview Summary: “The Examiner indicated that because the prior art was not searched with the part level as now understood specifically in mind, a new search would be necessary to make any determination of patentability.” Applicants understand that the Examiner did conduct a supplemental art search, and presumably found the Katayanagi reference, which relates to products in general, and which does not disclose aircraft or other machinery that employ engines, or any component part of an engine.

(7) Absent knowledge of Applicants’ invention, the Examiner has not provided any sufficient argument or explanation for having searched the prior art for any reference that teaches generally “a product that can be tagged to identify and track a part thereof”. The Examiner admitted that the only rationale for the search was Applicants’ invention description, since neither Muehl nor Martin disclose or suggest “a part” of an engine component. The Examiner

did not restrict the search to "engines" and their components, which might be reasonable to identify relevant prior art. In fact, such a search of the engine art only found Martin and Muehl, which do not anticipate or make obvious Applicants' invention.

(8) Instead, the Examiner provides the following inadequate rationale in support of a *prima facie* rejection. In part b. of the rejection, at page 3 starting at line 18, the Examiner states "storing more data and detailed information on individual parts of a larger component would have been obvious to one of ordinary skill... (Martin and Muehl) identify that storing information on the components is beneficial to track the components and store maintenance and repair histories" and "by the same reasoning... it would have been desirable for one of ordinary skill in the art at the time of the invention to modify the system to include more detailed information on the part level, rather than just the component." This is circuitous argument, not support. Basically, the Examiner argues that inventive steps used by the prior art should be imputed upon the latest prior art to advance the technology, and to arrive at the Applicants' invention. In other words, the prior art should be able to "invent" new prior art by adding new inventive steps onto old art. This is clearly not what the law provides or allows.

(9) The law is understood (citing bitlaw.com) to require the examiner to step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person. Knowledge of Applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences," conduct the search and evaluate the "subject matter as a whole" of the invention. While the tendency to resort to "hindsight" based upon Applicant's disclosure is often difficult to avoid due to the very nature of the examination process, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

(10) In the present case, the prior art of Martin and Muehl clearly do not suggest identifying and tracking the parts of an engine component. Nor did any of the prior art gleaned from the first search. The second search was motivated solely by Applicants' disclosure, and was not restricted to the subject matter of Applicants' claims, but to "any product" that included parts. The Examiner clearly did not "step backward in time and into the shoes worn by the

hypothetical ‘person of ordinary skill in the art’ when the invention was unknown”. Rather, having seen Applicant’s invention, he searched well outside the field of the invention (engines, and specifically turbine engines) to find any reference of a product in general that is tagged to identify and track a part thereof.

(11) The Examiner’s rejection continued “(i)n part, advances in technology, such as the development of smart cards and RFID tags have made the storage of data easier, while the capacity of such devices has increased greatly. These advances, along with the obvious desire to store information regarding maintenance and repairs, would have been obvious to one of ordinary skill in the art at the time of the invention.” Examiner seems to argue that “the invention is obvious because it is obvious.” The Applicant notes that Muehl discloses smart cards and RFID tags in great detail. Muehl was filed only 13 months before Applicants’ invention. If Applicant’s invention was so obvious in view of Muehl’s teaching, and the advances in smart cards and RFID tags at the time of Muehl, why did Muehl not disclose the claimed invention? Answer: because Applicants’ invention was not obvious to Muehl at the time that Muehl filed his application, nor obvious to anyone else at the time Applicants filed their application.

(12) The Examiner goes on to introduce Katayanagi, which he says teaches “the advances in technology and the requisite desire to store individual part information associated with components”. The Examiner’s argument again fails. Katayanagi adds nothing to the state of the art of smart cards and RFID tags that would have been known to Muehl at the time of Muehl’s invention. And the only desire “to store part information associated with components” comes from Applicants’ invention description.

In summary, the Examiner fails to support a *prima facie* rejection for obviousness in the combination of Martin and Muehl et al in view of Katayanagi et al. Neither Martin nor Muehl, nor their combination, the Examiner admits, disclose or suggest identifying and tracking information on “part” of an engine component. It appears that Katayanagi et al was searched for and selected by the Examiner because it teaches tracking and recording the replacement and maintenance history of parts for a product. Appellant contends, however, that there is no motivation to be found in either Martin or Muehl et al to reach out to and combine Katayanagi et al. Having found no hint of “parts of an engine component” in the turbine engine prior art, the

Examiner used Appellants' specification and claims as a blueprint search for any prior art that teaches a product that is tagged to track and record replacement and maintenance information about a part of that product; and he found Katayanagi. Such hind-sight in cobbling together the teachings of the prior art is not permitted, and demonstrates the failure of support for a *prima facie* rejection.

Therefore, the rejection does not factually support a *prima facie* conclusion of obviousness. Neither Martin nor Muehl et al., individually or in combination, disclose or suggest tagging of a component of an engine to identify and track the maintenance or operation of a part of that component, as claimed by Appellant. As such, there is no motivation in either Martin or Muehl to look to the teachings of Katayanagi.

Applicants request reconsideration and withdrawal of the rejection against Claims 1-10, 12, 14-17 and 19-29.

Claim 16

In addition to the arguments for patentability provided for Claim 1 et al. above, Appellants also contend that Claim 16, which is an embodiment of the invention that requires the information that is supplied and stored on the information storage device is from a remote location, is patentable over the rejection. Neither Martin, Muehl, or Katayanagi disclose or suggest such a limitation.

Issue 2: The Rejection of Claims 11 and 18 under 35 U.S.C. §103(a):

The Examiner rejects Claims 11 and 18 as unpatentable over the prior art combination of Martin, Muehl, Katayanagi and Vogan et al (US 5,968,107).

The Examiner states that the combination of Martin, Muehl and Katayanagi does not teach predicting future maintenance requirements from the data collected. The Examiner states that parameter trending of engines is commonly known, as disclosed in Vogan. Thus, he concludes, it would have been obvious to one of ordinary skill to use the stored parameter information in the system taught by the combined teachings of Martin, Muehl and Katayanagi, to predict future maintenance requirements thereof.

The References:

Martin, Muehl and Katayanagi are discussed above. Vogan discloses a system for tracking and trending the operating parameters for an engine, and to store the parameter data with a time index for future predictive analysis.

The Invention of Claims 11 and 18, Distinguished from the References:

Applicants' embodiment teaches the identification and tracking of individual parts of an engine component, and the accessing and recording of operation perimeters associated therewith. The rejection is improperly based on the Examiner's inappropriate application of the teachings of Vogan with those of Martin and Muehl et al. The Examiner has failed to support his *prima facie* rejection of obviousness.

(1) The Examiner has not identified any motivation in either Martin, Muehl et al, or Katayanagi to then search further into the prior art for the Applicants' teaching of parameter monitoring. Applicant points out that Vogan does not mention the "identification tagging" of individual engine components, as taught in Martin and Muehl. Nor do Martin or Muehl, or Katayanagi, mention or teach parameter tracking and analysis for maintenance purposes. Consequently, absent Applicants' specification as a blueprint, the Examiner can not show any motivation in any of Martin, Muehl or Katayanagi to consider Vogan, or any motivation in Vogan to consider Martin or Muehl or Katayanagi. Only through impermissible hindsight gained by reading Applicants' specification would one consider searching for and combining the teachings of these references.

(2) It is also noted that the Examiner considers that "it would be obvious to one of ordinary skill in the art, at the time of invention, to use the stored parameter information into the combined system of Martin, Muehl and Katayanagi". Applicants' note that both Martin and Muehl presumably represent persons of ordinary skill in this art. And though Muehl had the benefit of the knowledge of Vogan (his application was filed after the publication of Vogan), Muehl et al makes not mention of this feature of Applicants' embodiment, and does not even suggest that the operating parameters and conditions of the engine are of importance, or should be monitored or logged. Applicants contend that Muehl et al failed to appreciate the teachings of Vogan because he did not describe or even consider identifying and monitoring individual parts of his engine components.

Consequently, the teaching of Muehl et al itself demonstrates that the prior teaching of Vogan was not commonly known and used, particularly not commonly known and used in the turbine engine field of art.

Applicants request reconsideration and withdrawal of the rejection against Claims 11 and 18.

### SUMMARY

The Examiner erred in rejecting Claims 1-10, 12, 14-17 and as unpatentable under 35 U.S.C. §103(a) over Martin (4,280,185A), in view of Muehl et al (2004-0024501 A1), and Katayanagi et al (6,321,983). The grounds of rejection fail to support a *prima facie* case of obviousness.

The Examiner also erred in rejecting Claims 11 and 18 as unpatentable under 35 U.S.C. §103(a) over Martin, Muehl and Katayanagi, and further in view of Vogan. The grounds of rejection fail to support a *prima facie* case of obviousness, and are overcome by the arguments presented herein.

Accordingly, it is urged that Claim 1-12, and 14-29 as presented in APPENDIX A are allowable, and it is respectfully requested that the Honorable Board reverse the Examiner's rejection of the Claims.

Respectfully submitted,

For: Joshi et al.

By:

  
\_\_\_\_\_  
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December 14, 2006

## **CLAIM APPENDIX A**

1. An apparatus for recording, storing, updating, and retrieving operating, maintenance and repair information relating to at least one part of at least one individual engine component of a turbine engine, said apparatus comprising at least one information storage device permanently deployed on said at least one individual engine component said information storage device further comprising:
  - a) identification information about said at least one part of the individual engine component stored thereon;
  - b) at least one updatable data register having data storage capability, said data register referenced by stored identification information of said at least one part and a parameter recorded by said data register;wherein said information storage device is accessible for at least one of the following:
  - i) recording and storing maintenance work done when the individual engine component undergoes maintenance;
  - ii) updating said information storage device when said at least one part is exchanged for a replacement part; and
  - iii) retrieving recorded and stored information in said information storage device under certain selected conditions.
2. The apparatus of Claim 1 wherein information in said data register is updated by an engine control system.
3. The apparatus of Claim 1 wherein information in said data register is stored in said information storage device periodically at certain selected times.
4. The apparatus of Claim 1 wherein information in said data register is stored and updated in said information storage device each time the engine is stopped.

5. The apparatus of Claim 1 wherein information can only be added to said information storage device.
6. The apparatus of Claim 1 wherein said information storage device is capable of storing information over the operating life of an engine component.
7. The apparatus of Claim 6 wherein the stored information from each data register is permanent.
8. The apparatus of Claim 7 wherein stored information remains with the engine component for the life of the engine component.
9. The apparatus of Claim 1 wherein said information storage device is made an integral part of individual engine components.
10. The apparatus of Claim 1 wherein a plurality of said information storage devices is permanently mounted on a plurality of engine components.
11. The apparatus of Claim 10 wherein a plurality of said information storage devices on a plurality of engine components is polled to predict future maintenance requirements of the engine.
12. The apparatus of Claim 1 wherein anti-tampering devices prevent tampering with the data contents of said information storage device.
13. The apparatus of Claim 1 wherein maintenance activity must be recorded in said information storage device when maintenance is done for the engine to operate.
14. The apparatus of Claim 1 wherein the information recorded in said information storage device is provided by circuitry on board an engine.

15. The apparatus of Claim 1 wherein the information recorded in said information storage device is provided by circuitry external to said engine component.
16. The apparatus of Claim 1 wherein information is supplied to said information storage device from a remote location.
17. The apparatus of Claim 1 wherein at least one of the following:
  - a) recorded information
  - b) stored informationin said information storage device is retrieved from a remote location.
18. The apparatus of Claim 1 wherein at least one of the following:
  - a) recorded information
  - b) stored informationin said information storage device is used to predict future maintenance requirements of at least one engine component.
19. The apparatus of Claim 1 wherein said information storage device is queried to ensure that contractual requirements are met.
20. An apparatus for electronically recording, storing, updating, and retrieving operating, repair, and maintenance information relating to at least one life limiting part of at least one individual engine component of a gas turbine engine, the apparatus comprising at least one information storage device permanently deployed on said at least one individual engine component, the information storage device further comprising:
  - a) identification information of said at least one life limited part of the individual engine component stored thereon;

- b) at least one updatable data register having data storage capability for said at least one life limited part, said data register referenced by stored identification numbers of said at least one life limited part and a parameter recorded by said data register;

wherein said information storage device is accessible for at least one of the following:

- i) recording and storing maintenance work done when the individual engine component undergoes maintenance;
- ii) updating said information storage device with identification information of a replacement life limited part and appropriate settings for at least one data register when said at least one life limited part is changed; and
- iii) retrieving recorded and stored information in said information storage device under certain selected conditions.

21. The apparatus of Claim 20 wherein stored information remains in said information storage device on the engine component permanently.

22. The apparatus of Claim 20 wherein information in at least one data register is stored in a storage area in said information storage device periodically.

23. The apparatus of Claim 22 wherein information in at least one data register is stored in said information storage device each time the engine is stopped.

24. A method for recording, storing, updating and retrieving operating and maintenance information relating to at least one part of an individual engine component of a turbine engine, comprising the steps of:

- a) providing at least one information storage device permanently deployed on at least one individual engine component;
- b) storing identification information about the at least one part of the individual engine component in the information storage device;
- c) providing at least one updatable data register in the information storage device having data storage capability;

- d) referencing each data register with stored identification information of the at least one part and a parameter recorded by each data register;
- e) operating the engine and recording operating parameter data in at least one data register; and
- f) at least one of the following:
  - i) storing maintenance work done when the individual engine component undergoes maintenance;
  - ii) updating the information storage device when the at least one part is exchanged for a replacement part; and
  - iii) retrieving recorded and stored information from the information storage device under certain selectable conditions.

25. The method of Claim 24 comprising periodically storing information from at least one data register in a storage area of the information storage device at certain selectable times.

26. The method of Claim 25 comprising storing information from at least one data register in the information storage device each time the engine is stopped.

27. A method for electronically recording, storing, updating and retrieving operating and maintenance information relating to at least one life limiting part of at least one individual engine component of a gas turbine engine comprising the steps of:

- a) providing at least one information storage device permanently deployed on at the least one individual engine component;
- b) storing identification information about the at least one life limited part of the individual engine component in the information storage device;
- c) providing at least one updatable data register in the information storage device having data storage capability to record data parameters being measured and place them in a storage area of the information storage device;
- d) referencing each data register with stored identification information of the at least one life limited part and a parameter recorded by each data register;

- e) operating the engine and recording operating parameter data in at least one data register; and
- f) at least one of the following:
  - i) storing maintenance work done when the individual engine component undergoes maintenance;
  - ii) updating the information storage device when the at least one life limiting part is exchanged for a replacement part; and
  - iii) retrieving recorded and stored information from the information storage device under certain selectable conditions.

28. The method of Claim 27 comprising periodically storing information from at least one data register in a storage area in the information storage device at certain selectable times.

29. The method of Claim 27 comprising keeping stored information in the information storage device on the engine component for the life of the engine component.

**EVIDENCE APPENDIX B**

NONE

**RELATED PROCEEDINGS APPENDIX C**

NONE